

CLAIMS

What is claimed is:

Sub 93

1. A semiconductor die assembly comprising:
a semiconductor die having a plurality of bond pads on an active surface thereof;
a lead frame having at least a first group of lead fingers and a second group of lead fingers to respectively extend from first and second opposing sides of said semiconductor die attached to a die-attach location on said lead frame to another, single side of the lead frame in a substantially mutually parallel configuration;
a first voltage reference plane to overly in immediate proximity said first group of lead fingers and in electrical isolation therefrom; and
a second voltage reference plane to overly in immediate proximity said second group of lead fingers and in electrical isolation therefrom.

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2. The assembly of claim 1, wherein said lead frame comprises a vertical surface mount package configuration.

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3. The assembly of claim 1, wherein said first voltage reference plane and said second voltage reference plane is adhered to at least some of the lead fingers of said first group of lead fingers and said second group of lead fingers, respectively.

4. The assembly of claim 3, wherein said first voltage reference plane and said second voltage reference plane is adhered directly via a non-conductive adhesive to said at least some of the lead fingers of said first group of lead fingers and said second group of lead fingers, respectively.

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5. The assembly of claim 1, further comprising a packaging material encapsulating at least said active surface of said semiconductor die.

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6. The assembly of claim 5, wherein said packaging material at least partially covers said first and said second voltage reference plane and said first and said second group of lead fingers.

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7. The assembly of claim 1, wherein said lead frame includes a die-attach paddle to which said semiconductor die is attached.

8. The assembly of claim 1, wherein said die-attach location comprises a die-attach paddle.

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9. The assembly of claim 1, wherein said first voltage reference plane and said second voltage reference plane is electrically connected to at least one lead finger of said first group of lead fingers and said second group of lead fingers, respectively, which in turn is connected through a bond pad to a reference potential of said semiconductor die.

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10. The assembly of claim 1, wherein at least one of said first voltage reference plane and said second voltage reference plane includes projections extending away from a direction of said immediate proximity of said first group of lead fingers and said second group of lead fingers, respectively.

11. The assembly of claim 10, further comprising a packaging material extending over at least one of said first voltage reference plane and said second voltage reference plane, wherein said projections extend through said packaging material.

12. The assembly of claim 11, wherein said projections extend through said packaging material to an exterior surface thereof.

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13. The assembly of claim 1, wherein said first voltage reference plane and said second voltage reference plane is of sufficient mass to measurably alter heat transfer characteristics of said assembly.

Sub 81 > 14. The assembly of claim 1, further comprising a packaging material encapsulating said assembly so that only outer ends of said at least said first group of lead fingers and said second group of lead fingers extend therethrough.

Sub 98 15. The assembly of claim 1, wherein said first voltage reference plane and said second voltage reference plane extends over at least about fifty percent of a surface area of said at least said first group of lead fingers and said second group of lead fingers, respectively.

16. The assembly of claim 1, wherein said first voltage reference plane and said second voltage reference is separated from said at least said first group of lead fingers and said second group of lead fingers, respectively, by an insulating adhesive structure.

17. The assembly of claim 16, wherein said insulating adhesive structure comprises an insulating film having an adhesive on opposing surfaces thereof, one surface being adhered to at least one of said first group of lead fingers and said second group of lead fingers and another surface to at least one of said first voltage reference plane and said second voltage reference plane.

18. A vertical surface mount lead frame to be assembled to a semiconductor die, comprising:
a lead frame having at least a first group of lead fingers and a second group of lead fingers to respectively extend from first and second opposing sides of an intended die-attach location to another, single side of said lead frame in a substantially mutually parallel configuration;
a first voltage reference plane to overly in immediate proximity said first group of lead fingers and in electrical isolation therefrom; and
a second voltage reference plane to overly in immediate proximity said second group of lead fingers and in electrical isolation therefrom.

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19. The assembly of claim 18, wherein said first voltage reference plane and said second voltage reference plane is adhered to at least some of the lead fingers of said first group of lead fingers and said second group of lead fingers, respectively.

20. The assembly of claim 19, wherein said first voltage reference plane and said second voltage reference plane is adhered directly via a non-conductive adhesive to said at least some of the lead fingers of said first group of lead fingers and said second group of lead fingers, respectively.

Sub 1
21. The assembly of claim 18, wherein said lead frame includes a die-attach paddle to which said semiconductor die is attached.

22. The assembly of claim 18, wherein said die-attach location comprises a die-attach paddle.

23. The assembly of claim 18, wherein at least one of said first voltage reference plane and said second voltage reference plane includes projections extending away from a direction of said immediate proximity of said first group of lead fingers and said second group of lead fingers, respectively.

Sub 1
24. The assembly of claim 18, wherein said first voltage reference plane and said second voltage reference plane extends over at least about fifty percent of a surface area of said at least said first group of lead fingers and said second group of lead fingers, respectively.

Sub 1
25. The assembly of claim 18, wherein said first voltage reference plane and said second voltage reference is separated from said at least said first group of lead fingers and said second group of lead fingers, respectively, by an insulating adhesive structure.

26. The assembly of claim 25, wherein said insulating adhesive structure comprises an insulating film having an adhesive on opposing surfaces thereof, one surface being adhered to at least one of said first group of lead fingers and said second group of lead fingers and another surface to at least one of said first voltage reference plane and said second voltage reference plane.